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Transitioning to Independence and Maintaining Research Careers in a New Funding Climate: American Society of Preventive Oncology Junior Members Interest Group Report

Jada G. Hamilton^{1,2}, Wendy C. Birmingham⁵, Parisa Tehranifar⁶, Melinda L. Irwin⁷, William M.P. Klein⁴, Linda Nebeling³, and Jessica Chubak^{8,9}

Abstract

The American Society of Preventive Oncology (ASPO) is a professional society for multi-disciplinary investigators in cancer prevention and control. The ASPO Junior Members Interest Group promotes the interests of predoctoral, postdoctoral, and junior faculty members within the Society, and provides them with career development and training opportunities. To this end, as part of the 37th ASPO Annual Meeting held in Memphis, Tennessee in March 2013, the Junior Members Interest Group organized a session designed to address issues faced by early-career investigators as they navigate the transition to become an independent, well-funded scientist with a sustainable program of research in the current climate of reduced and limited resources. Four speakers were invited to provide their complementary but distinct perspectives on this topic based on their personal experiences in academic, research-intensive positions and in federal funding agencies. This report summarizes the main themes that emerged from the speakers' presentations and audience questions related to mentoring; obtaining grant funding; publishing; developing expertise; navigating appointments, promotion, and tenure; and balancing demands. These lessons can be used by early-career investigators in cancer prevention and control as they transition to independence and build programs of fundable research. *Cancer Epidemiol Biomarkers Prev*; 22(11); 2138–42. ©2013 AACR.

Introduction

The American Society of Preventive Oncology (ASPO) is a professional society for multidisciplinary investigators in cancer prevention and control. ASPO aims to provide excellent professional development opportunities for investigators at all career stages to maximize their success. To this end, the Junior Members Interest Group was formed in 1999 to promote the interests of predoctoral, postdoctoral, and junior faculty members within the Society, and to provide them with career development and training opportunities (1). Members of the Junior Members Interest Group serve on the ASPO Executive Committee

and the Program Planning Committee, and organize professional development sessions at each ASPO annual meeting.

As part of the 2013 ASPO annual meeting, the Junior Members Interest Group organized a session entitled "Transitioning to Independence and Maintaining Research Careers in a New Funding Climate." This session was designed to address the issues faced by early-career investigators as they navigate the transition to become an independent, well-funded scientist with a sustainable program of research. The main focus of the session was on the transition from early- to mid-career that occurs when one moves from the role of assistant- to associate-level investigator in academic and other research-intensive positions. This topic was considered especially relevant given recent reductions in federal research funding (2). Four speakers were invited to provide their complementary but distinct perspectives on this topic: Melinda L. Irwin (Associate Professor of Chronic Disease Epidemiology, Yale School of Public Health and co-leader of the Cancer Prevention and Control Research Program, Yale Cancer Center, New Haven, CT) to provide the perspective of an associate-level investigator; Paul Jacobsen (Senior Member and Associate Center Director of the Division of Population Science, Moffitt Cancer Center and Research Institute, Tampa, FL) to provide the perspective of a senior-level investigator; and Linda Nebeling (Chief of the Health Behaviors Research Branch, National Cancer Institute, Rockville,

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MD) and William Klein (Associate Director of the Behavioral Research Program, National Cancer Institute, Rockville, MD) to provide the perspectives of a federal funding agency. This report summarizes the main themes that emerged from the speakers' presentations and audience questions during the session.

Mentoring

Each speaker noted the importance of mentoring across all the stages of a research career. A scientist never really stops being mentored; rather, the experience of being mentored changes as one develops as a researcher. Over the course of a career, a researcher will have multiple mentors who fulfill different needs. For example, it is important for mentors of postdoctoral fellows to provide exposure to all phases of research including designing studies, analyzing and interpreting findings, preparing manuscripts and grant applications, and developing, justifying, and managing budgets. As an early-career investigator, it is important to identify a mentor (or mentors) within one's institution who understands the unique cultures of both the department and broader institution, and who can help with navigating internal politics and policies about promotion and tenure. It can be advantageous to identify a mentor whose research is distinct, yet has some overlap with the mentee's work; such a mentor could serve as a senior coinvestigator on grant applications, and her/his research could provide preliminary data for the mentee's grant applications. It can also be beneficial to identify mentors outside of one's field or institution. Mentors outside of the immediate field or institution may offer a broader point of view, be less impacted by internal politics, and may have alternate perspectives that could be instructive. When identifying mentors, it can be helpful to reach out to those with a good mentoring track record (e.g., those who have received institutional mentoring awards, or who have mentored successful colleagues, yet also are not overcommitted mentoring other junior faculty). Mentors and mentees should thoughtfully consider and mutually establish the goals of the mentoring relationship, and specify the expectations of the mentor and mentee.

As early-career investigators transition through their careers, they will also be expected to take on increasingly involved roles as mentors. For example, as an assistant-level investigator in an academic setting, one may be expected to serve on a few (e.g., 2–3) student thesis committees per year. Upon promotion to associate-level investigator, one may be expected to also supervise and mentor two to three students, postdoctoral fellows, or junior faculty members per year. Senior-level investigators are often expected to provide even greater mentoring service, for instance, serving on several student thesis committees and mentoring multiple students, postdoctoral fellows, and junior faculty.

Obtaining Grant Funding

Successfully competing for grant funding can be a source of anxiety for many new and early-career investigators, especially in the current climate of reduced and limited resources. Success rates for NIH R01-equivalent awards have decreased overall in recent years—for example, in 2000, new investigators (i.e., individuals who have not previously competed successfully as a principal investigator for a substantial NIH independent research award) had a success rate of 22% for NIH R01-equivalent awards compared with 29% among established investigators; in 2012, success rates were 13% among new investigators and 16% among established investigators (3). This downward trend and the precipitous drop in success rates for established investigators are discouraging; however, these figures also suggest that funding disparities between new and established investigators have generally decreased at the NIH level.

Given this competitive environment, it is critical for early-career investigators to understand what mechanisms and funding opportunities are available to them from federal agencies such as the NIH (see grants1.nih.gov/grants/new_investigators) and private and research foundations. When preparing a grant application, it is important to identify individuals within the funding organization who "speak the language" of one's specific discipline. For example, NIH program officers (also known as POs, or as program directors or PDs) can be an excellent resource for helping applicants to understand the mission and current funding priorities of an institute. Many program officers participate in professional societies such as ASPO, and are familiar with the needs and challenges faced by early-career investigators in the field of cancer prevention and control. After reviewing available materials, such as funding announcements and institute websites, investigators at all stages should consider setting up an appointment with a relevant program officer to discuss specific questions about funding opportunities, as well as their research ideas or specific aims. Program officers can also provide strategies for identifying the appropriate study section with the necessary expertise to review a given project, and can often provide insight about reviewer comments.

Anecdotal reports from the session speakers suggest that individual investigators are submitting greater numbers of grant proposals in an effort to secure funding in the increasingly competitive climate, and these observations are supported by NIH level data (4). Investigators at all career stages should be thoughtful about how to maximize their efforts; for example, it can be useful to submit complementary proposals to multiple funding sources (being mindful of the submission differences across agencies and the need to disclose all the sources of other support to prevent conflicts in funding), or to consider developing projects that use the same population or data source to evaluate different outcomes in a cost-effective manner. Investigators should

look to multiple funding sources, including institutional, private, and research foundations. Although the amount of funding offered by such foundations may be less than that of federal R01-equivalent awards, such funding can be extremely useful for collecting pilot and preliminary data for future applications. Furthermore, in response to the current funding climate, many institutions are now expanding their definition of "peer-reviewed grants" beyond NIH R01 awards when making promotion and tenure decisions. Similarly, some institutions are considering the submission, rather than just the ultimate success, of qualified grant applications as an important marker of an investigator's progress. Thus, it can be valuable to show that one is submitting grants to multiple funding sources, and that one's applications are on a positive trajectory (e.g., receiving increasingly improved scores).

The speakers also emphasized the importance of collaboration in the grant-writing process. Senior coinvestigators not only provide expertise necessary for achieving the goals of a grant, but also can be critical for helping early-career investigators obtain pilot data and develop realistic study timelines and study recruitment and data collection objectives. Colleagues, both inside and outside of an investigator's institution, can provide valuable feedback on grant proposals, and investigators should seek out honest and critical evaluations from those with diverse expertise. Early-career investigators, in particular, should keep in mind that grant writing is a skill that can be developed and refined with time and experience. When preparing a grant application, one should ask whether the idea is feasible, innovative, clinically relevant, and timely; whether the results will support the next steps of a program of research; and whether the proposal falls within the funding agency's primary mission or stated area of interest (for additional tips on grant preparation, see ref. 5). When receiving the formal evaluation of a grant submission, investigators should look at reviewer comments as an opportunity to make the application that much stronger for the next submission. Finally, early-career investigators need to remember that some grant applications will inevitably be rejected, and that they should remain persistent and not take the rejection personally.

Publishing

It is well known that publishing in peer-reviewed journals is important for investigators of all career stages. Although investigators may feel pressure to focus on quantity in terms of the number of publications, the quality of publications is generally more important. Quality matters in terms of both the content of a given manuscript and where that manuscript is published; specifically, investigators should consider a journal's impact factor and the scope of a journal's audience. It is imperative that early-career investigators understand their institution's specific publishing expectations. Although

publishing expectations can vary across institutions, it is not unusual for research-intensive positions to expect investigators to publish four to five peer-reviewed articles per year in recognized journals. For early-career investigators, a greater focus is placed on the first-author position on publications; as one becomes a more established investigator, a greater focus is placed on the senior-author position (although this varies somewhat by discipline). To achieve such expectations, early-career investigators should develop collaborations both within and outside their departments, programs, and institutions, and should consider the prospect of analyzing existing data sources (e.g., secondary data analyses) that can provide opportunities for hypothesis generation and provide a foundation for subsequent primary data collection.

Developing Your Expertise

The development of an investigator's expertise typically follows a specific trajectory over the course of a research career. In the early stages of a career, an investigator should establish depth of knowledge, and be able to show her/his role as an expert in a specific content area. As an investigator becomes more established, her/his expertise can begin to develop greater breadth. Thus, early-career investigators may choose to focus primarily on one scientific question or area, and develop a line of research that builds expertise in this area. For instance, an investigator may begin with a tightly focused set of observational or mechanistic studies that describe the processes underlying a given public health problem, and that leads to the development of an intervention to improve health outcomes. When seeking positions, early-career investigators should look for opportunities that allow them to establish their depth of expertise, while simultaneously adding breadth to an institution or department. Through this process, early-career investigators will learn to identify and articulate what makes their research innovative and significant. Early-career investigators should also strive to build collaborations with researchers having different types of scientific expertise; developing such transdisciplinary collaborations can have benefits for one's research productivity (6), improve the chances of obtaining funding, and also increase an investigator's visibility in the larger research community (an important objective for promotion and tenure, as external letter writers may thus be more likely to recognize an investigator's scientific expertise).

Early-career investigators must also develop administrative expertise, particularly in relation to their institution's fiscal operations and budget management for their funded research. There are many requirements for proper grant budget tracking and accounting; yet, often early-career investigators do not focus on the administrative aspects that are related to their research funding until a problem arises. The resulting fiscal

challenges may generate a permanent impact on a grant's remaining budget balance. Understanding how to track and read accounting statements affiliated with a grant's NIH Notice of Award or an institution's fiscal office will help to prevent costly mistakes down the road. Early-career investigators should keep in mind that NIH grant funds are awarded to the institution, not the individual investigator. Thus, it is in the best interest of the investigator to understand how fiscal resources are managed by one's institution. Formal instruction about these skills rarely exists, thus early-career investigators need to be proactive in seeking out information, asking relevant questions, and developing relationships with their institution's fiscal administration personnel and project managers. Experienced research mentors can also offer insight on valuable best practices for these skills.

Appointments, Promotion, and Tenure

Although specific expectations vary across institutions, a number of common elements are considered in the appointment, promotion, and tenure process, typically in the broad domains of research, education, and service. When early-career investigators are seeking positions, they should request information about the promotion and tenure process in order to understand the institution's expectations. Investigators should strive to learn their institution's guidelines and policies about timelines, criteria, and review procedures from the first day of their appointment. It can also be extremely beneficial from the start to systematically collect the information needed for the promotion and tenure packet (e.g., evidence of educational activities such as guest lectures and evaluations from presentations, evidence of service such as committee work). Documenting such materials in real time will be much simpler than trying to reconstruct this information when it is needed, often years later. It is likely that everything one collects will not be relevant in the end, but it will make for a much easier experience and process to have it all organized and accessible.

Goal setting is an important activity for investigators as they progress toward promotion and tenure. A recommended strategy is to set specific and measurable annual goals related to the domains that will be evaluated by the promotion and tenure committee. For instance, one may set goals related to publications (e.g., how many manuscripts could be developed, on which topics, and with which authorship position; which journals to target), grants (e.g., how many proposals could be submitted on the basis of the submission deadline calendar, which collaborators to approach), educational activities (e.g., possible guest lecturers, departmental presentations, students to be mentored), and service activities (committee participation, community service, journal and grant reviewing). Investigators should review their annual goals and past progress with their Chair or

Section Leader, as well as their mentors. Such individuals can give valuable advice and constructive feedback, and may also aid early-career investigators with identifying important leadership and training opportunities. For example, more senior-level investigators may be able to refer early-career investigators to serve on grant review panels, or help build connections that lead to invited speaking opportunities at other institutions. These types of experiences will help early-career investigators to build a national and international reputation, which will ultimately make them stronger candidates for promotion and tenure.

Balancing Demands

Investigators at all career stages are faced with multiple, and sometimes competing, professional demands. For many, research-related tasks (e.g., grant writing, manuscript preparation) will need to be a main priority; however, investigators must continue to make progress in each of the domains that are valued by their institutions. Investigators can benefit from being mindful of the various phases of their research—their past work (e.g., completed projects to be written up into manuscripts, or datasets that are available for new analyses), present work (e.g., ongoing data collection or analyses), and future work (e.g., grants in preparation or studies in development) – and how these different projects ultimately fit together in a programmatic sense. Developing time-management skills and the ability to efficiently execute one's responsibilities can be critical for allowing investigators to establish a work-life balance. Furthermore, selecting a position and institution that offers a degree of autonomy and flexibility can promote greater balance. Finally, the speakers emphasized the importance of maintaining relationships with peers at the same career stage (regardless of their institution or discipline), as they can be essential for providing perspective and support as investigators navigate their research careers.

Concluding Thoughts

Investigators in the field of cancer prevention and control are presented with the challenge of achieving early and sustained productivity, and this challenge is amplified in the current fiscal climate given pervasive concerns about limited resources. It is important for investigators across all career stages to have realistic expectations, and to develop programs of research that address timely and novel issues in cancer prevention and control. To develop such a program of research, investigators must obtain strong mentoring and be thoughtful about ways to showcase and develop their expertise. These specific needs can be addressed by individuals and opportunities within an early-career investigator's institution, as well as through involvement in professional societies including ASPO that offer multidisciplinary expertise and supportive resources to help investigators excel in their careers in cancer prevention and

control. Publishing and grant writing will remain top priorities for most investigators, and are skills to be cultivated and developed over time. Knowing from whom to seek advice and help (e.g., mentors, department Chair, program officers, coinvestigators, peers) and what kind of guidance to seek emerged as important ingredients for success. As investigators advance through their careers and through the promotion and tenure process, there is a need for simplicity and clarity in the development of research questions, as well as perseverance and mindfulness about balancing various personal and professional demands. Ultimately, having a

burning research question, good mentoring, persistence, and a little luck will help early-career investigators to navigate their transition to independence and maintain a successful research career.

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